

Backgrounder: Alectra Drive for the Workplace – Markham Civic Centre

Context:

- The goal of the ‘Alectra Drive for the Workplace’ project at the City of Markham is to demonstrate the value of a smart electric vehicle (EV) charging system that balances the electricity needed to serve the building and EV charging stations to mitigate potential cost increases, and provide an easy and accessible charging solution for employees that encourages the adoption of EV technology.
- The Distributed Resource Management System (DRMS) and EV charging stations were installed starting in the summer of 2017.
- The EV charging stations were installed in the northwest corner of the main parking lot and the indoor parking garage at the Markham Civic Centre.
- Integration, commissioning and testing will continue over the course of the three-month baseline data collection and driver participation period, followed by a minimum of 12 months of managed charging.
- The pilot program was designed to limit cost impacts to the City of Markham, with increases in electricity costs mitigated through managed charging to avoid (or even reduce) increases in demand charges, and by scheduling charging at low-cost periods.
- The cost of employees’ electricity usage for charging will be covered by Aviva Canada, one of the country’s leading property and casualty insurance groups, through a sponsorship agreement with the City of Markham.
- Alectra will own and operate the charging station equipment, and be responsible for all maintenance costs during the pilot program.

Pilot program location and participants:

- Alectra selected the Markham Civic Centre for the following reasons:
 - The City of Markham has a strong history of leadership and collaboration on sustainability projects in the region;
 - Five City Council and staff members currently drive EVs to work, and large staff complement;
 - One EV added to the City’s fleet in 2017;
 - Existing Building Automation System (BAS) technology and staff expertise.
- A survey in March 2017 found that there should be enough possible EV purchasers between City staff and Unionville High School staff to meet the 15 participant target.
- To grow the EV user base to meet the pilot program targets, an EV awareness and experience campaign was initiated for City staff by the pilot program team, led by staff at the City of Markham and supported by Plug’n Drive.

- Participants will sign a program participant agreement, in which they will agree to install data loggers in their EVs to collect driving and charging information, and to participate in surveys and focus groups throughout the duration of the program.

Benefits to partners:

- As per the Government of Ontario's 2016 Climate Change Action Plan, workplace charging will be required in new commercial facilities beginning in 2018.
- The Government of Ontario's vision is for 5% of new car sales to be EVs by 2020.
- Increased availability of charging stations will enhance EV adoption and alleviate battery range anxiety.
- Managed EV charging presents a potential revenue stream for the City of Markham and Alectra Utilities.
- The potential market for workplace EV charging systems that manage electricity demand is approximately 13,000 commercial customers in the Alectra Utilities service territory.
- Take a leadership position and promote public awareness of EVs in Ontario.

Benefits to participants:

- Convenience of EV charging at work at no cost during the pilot program.
- EV drivers will be provided with enough battery charge to meet or exceed their daily commute requirements during the time that they are at the workplace.
- Savings on vehicle maintenance, insurance and gas from driving electric.
- Special EV-related offers for participants to encourage adoption.
- Up to \$14,000 provincial government EV purchase incentive.
- Up to \$1,000 in provincial government incentives to purchase and install an EV charging station for home use.
- The energy management solutions in place with this pilot program will provide overall flexibility and protection to the provincial electricity grid.
- EVs reduce fossil fuel consumption and greenhouse gas emissions, as well as the resulting climate change.

Markham's long-term energy goals and strategies:

- The Alectra Drive for the Workplace charging pilot program aligns well with the City's goals and strategies:
 - Greenprint, Markham's Community Sustainability Plan, which targets net zero energy, water, waste and emissions by 2050;

- Baseline data (2011-2014) indicate that the City's largest opportunities for reducing emissions are in buildings (49%) and transportation (37%);
- Corporate Energy Management Plan (CEMP) illustrates key actions the City intends to pursue to better manage energy and continue to be a leader in sustainability.
- Focus on Building Automation System (BAS) optimization has delivered approximately \$116,000 in energy savings and cost avoidance in less than one year starting 2016.
- The City also participates in the IESO's Demand Response (DR) program wherein facilities are paid to curtail their energy demand during peak hours. The system installed for this project will simplify operation and analysis of the City's participation in the DR program, which is an ancillary benefit.
- The City has one of the largest hosted solar portfolios of any municipality in Ontario.

Project Partners – Roles and Contributions:

The 'Alectra Drive for the Workplace' project at the City of Markham would not be possible without the collaborative efforts of multiple partners in designing and implementing an integrated and automated EV workplace charging solution. The key partners in this project are as follows:

Natural Resources Canada – provider of project funding from its [Electric Vehicle Infrastructure Demonstrations](#) component of the Energy Innovation Program (EIP), which supports clean technology research and development to promote sustainable economic growth and to support Canada's transition towards a low-carbon economy.

Independent Electricity System Operator (IESO) – provider of project funding from the IESO Conservation Fund, which supports innovative conservation and demand management technologies, practices, research and programs that have the potential to deliver significant energy savings.

Schneider Electric – is leading the digital transformation of energy management and automation in homes, buildings, data centers, infrastructure and industries. Provider of EcoStruxure Microgrid Advisor, facilitating EV and distributed energy resources integration using predictive analytics and algorithms for energy optimization and forecast of various distributed energy resources, demand response and hour-ahead energy pricing. Schneider Electric has brought significant in-kind support to the project.

FleetCarma – has a unique *SmartCharge Manager* solution that integrates electric vehicle data (i.e. state-of-charge) with charging station information to intelligently schedule and shape electric vehicle charging. FleetCarma is a Waterloo-based technology company that manufactures in Ontario and has deployments in over 30 countries.

Util-Assist – supports utilities to implement solutions that support their business, primarily through metering solution development data analysis, and customer service. For this project, Util-Assist is providing electricity pricing and demand response signals to the DRMS platform.

Aviva Canada – energy sponsor responsible for the cost of electricity to charge the program participants' EVs at the Markham Civic Centre.

Robertson Bright Inc. – provider of installation services for electrical infrastructure and charging stations at the facility.

Plug'n Drive – provider of customer engagement (both business and individuals) to support participation in the project, and EV driver support for participants.

Eguana Technologies – provider of electricity battery storage solutions. They are providing equipment and labour for an integrated energy storage system including the power control system and batteries.

FLO – provider and operator of the EV charging stations. Stations will be connected to the FLO network and monitored remotely from FLO's national operation centre to ensure reliability, service quality and maintenance.